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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/679,498	10/07/2003	Burkhard K. Neidecker-Lutz	13909-128001 / 2003P00162	8438

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EXAMINER	
DWIVEDI, MAHESH H	
ART UNIT	**PAPER NUMBER**
2168	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/679,498	NEIDECKER-LUTZ, BURKHARD K.	
	Examiner	Art Unit	
	Mahesh H. Dwivedi	2168	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14 and 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/7/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/08/2006 has been entered.

Remarks

2. Receipt of Applicant's Amendment, filed on 12/06/2006, is acknowledged. The amendment includes the cancellation of claims 15-20, the amending of claims 1, 9-10, and 14, and the addition of claim 21.

Specification

3. The objections raised in the office action mailed on 09/06/2006 have been overcome by the applicant's amendments received on 12/06/2006.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section

351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-14, and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by **Amor et al.** (U.S. Patent 6,546,382).

6. Regarding claim 1, **Amor** teaches a data store query system comprising:

A) a data store that includes a collection of records; (Column 3, lines 26-31);

B) a constant-sized sorted result buffer (Column 3, lines 31-47); and

C) a query interface operable to receive a limit and order query that includes both of an order criteria and a limit criteria (Column 1, lines 49-53, Column 2, lines 51-58);

D) the limit criteria specifying a maximum number N of records for a result set of records satisfying the limit and order query (Column 1, lines 54-59); and

E) to output the sorted result buffer as the result set of records (Column 5, lines 13-15);

F) to fill the sorted result buffer with a first N number of records from the data store (Column 3, lines 40-44);

G) to iteratively order the sorted result buffer based upon the order criteria (Column 3, lines 56-64);

H) iteratively compare remaining records in the data store against a Nth record in the sorted result buffer based upon the order criteria (Column 4, lines 12-16, lines 32-44);

I) to iteratively replace the Nth record in the sorted result buffer with a remaining record in the data store based upon iteratively comparing remaining records in the data store against the Nth record in the sorted result buffer (Column 4, lines 32-44).

The examiner notes that **Amor** teaches **"a data store that includes a collection of records"** as "The process is performed when a database system detects a Row Restricted Orderby Subquery and scans data from the table that contains the table referenced by the ORDER BY clause. The process is based on the formation of one or more TOP N subsets" (Column 3, lines 26-31). The examiner further notes that **Amor** teaches **"a constant-sized sorted result buffer"** as "A TOP N subset is a subset of rows that the process determines cannot be excluded from the TOP N rows in the order requested by a query. That is, a TOP N subset contains rows that are candidates for the TOP N rows in order" (Column 3, lines 31-34) and "the initial TOP N set is formed. The initial TOP N set includes the first N rows scanned. The initial N rows scanned are in the TOP N subset because, at least initially, they may all be TOP N rows. In this example, the first 10 rows scanned are from the payroll table, and thus the initial TOP N subset is formed" (Column 3, lines 40-44). The examiner further notes that **Amor** teaches **"a query interface operable to receive a limit and order query that includes both of an order criteria and a limit criteria"** as "Rows may be returned in ascending or descending order. The default is ascending. The return order may be specified using the keyword ASC for ascending or DESC for descending" (Column 1, lines 49-53) and "According to an embodiment of the present invention, a TOP N operation is performed through the use of a subquery that includes an ORDER BY clause and a restriction that references the result set of the subquery. The following query EX is provided as an example: SELECT salary FROM (SELECT salary FROM payroll ORDER BY salary) WHERE rownum<10" (Column 2, lines 51-58). The

examiner further notes that **Amor** teaches **"the limit criteria specifying a maximum number N of records for a result set of records satisfying the limit and order query"** as "A user that requests ordered data may desire only the TOP N rows in order. The term "TOP N" refers to the first N data items in an ordered set of data items. For example, the first 10 rows from payroll in ascending order based on salary. An operation or process that returns the TOP N data items based on an order is referred to as a TOP N operation" (Column 1, lines 54-59). The examiner further notes that **Amor** teaches **"to output the sorted result buffer as the result set of records"** as "The execution of the steps ends, and the result set is returned in TOP N order" (Column 5, lines 13-15). The examiner further notes that **Amor** teaches **"to fill the sorted result buffer with a first N number of records from the data store"** as "the initial TOP N set is formed. The initial TOP N set includes the first N rows scanned. The initial N rows scanned are in the TOP N subset because, at least initially, they may all be TOP N rows. In this example, the first 10 rows scanned are from the payroll table, and thus the initial TOP N subset is formed" (Column 3, lines 40-44). The examiner further notes that **Amor** teaches **"to iteratively order the sorted result buffer based upon the order criteria"** as "At step 114, the entry threshold is established. The entry threshold is used to determine whether a scanned row belongs to the current TOP N subset. The entry threshold is compared to the sort value of each row as the row is scanned. How the threshold is established and used is based on whether the result set to be returned for the subquery should be in ascending or descending order. If the subquery returns the result set in descending order, then the threshold is the smallest sort value in the

current TOP N subset. If the sort value of the scanned row is greater than the threshold, then the scanned row is added to the current TOP N subset" (Column 3, lines 56-64). The examiner further notes that **Amor** teaches **"iteratively compare remaining records in the data store against a Nth record in the sorted result buffer based upon the order criteria"** as "At step 126, the sort value of the scanned row is compared with the threshold to determine whether the row belongs in the current TOP N subset. In this example, the scanned row has a sort value of 75000, which is greater than the threshold. Therefore, the row belongs to the TOP N subset" (Column 4, lines 12-16). The examiner further notes that **Amor** teaches **"to iteratively replace the Nth record in the sorted result buffer with a remaining record in the data store based upon iteratively comparing remaining records in the data store against the Nth record in the sorted result buffer"** as "For example, in the current illustration, the member of the TOP N subset that was removed had a sort value of 50000, the value upon which the current threshold was based. After removing that row from the TOP N set and adding the current row, the lowest sort value of any member of the current TOP N subset is 60000. At step 148, the entry threshold is recalculated to the lowest sort value of the rows that belong to the current TOP N subset. In the current illustration, the entry threshold is adjusted to 60000" (Column 4, lines 32-44).

Regarding claim 2, **Amor** further teaches a data store query system comprising:

A) wherein the data store is a database or a fast cache (Pages 219-220).

The examiner notes that **Amor** teaches **"wherein the data store is a database or a fast cache"** as "To retrieve the top 10 salary values stored in the salary column of the payroll table, a user process issues a query to the database system that contains payroll. To the get rows with the top 10 salary values, the user issues the query B2 to the database system. The database system returns to the user all the rows from payroll in an order according to the values in salary. The user then retains the first 10 rows received, and discards the rest" (Column 1, lines 60-67).

Regarding claim 3, **Amor** further teaches a data store query system comprising:
A) wherein the collection of records further comprises a table having an attribute (Column 1, lines 60-67, Column 2, lines 51-58); and
B) wherein the query interface is operable to receive the limit and order query placing order constraints on the attribute (Column 1, lines 60-67, Column 2, lines 51-58).

The examiner notes that **Amor** teaches **"wherein the collection of records further comprises a table having an attribute"** as "To retrieve the top 10 salary values stored in the salary column of the payroll table, a user process issues a query to the database system that contains payroll. To the get rows with the top 10 salary values, the user issues the query B2 to the database system. The database system returns to the user all the rows from payroll in an order according to the values in salary. The user then retains the first 10 rows received, and discards the rest" (Column 1, lines 60-67) and "According to an embodiment of the present invention, a TOP N operation is performed through the use of a subquery that includes an ORDER BY clause and a

restriction that references the result set of the subquery. The following query EX is provided as an example: SELECT salary FROM (SELECT salary FROM payroll ORDER BY salary) WHERE rownum<10" (Column 2, lines 51-58). The examiner further notes that **Amor** teaches **"wherein the query interface is operable to receive the limit and order query placing order constraints on the attribute"** as "To retrieve the top 10 salary values stored in the salary column of the payroll table, a user process issues a query to the database system that contains payroll. To the get rows with the top 10 salary values, the user issues the query B2 to the database system. The database system returns to the user all the rows from payroll in an order according to the values in salary. The user then retains the first 10 rows received, and discards the rest" (Column 1, lines 60-67) and "According to an embodiment of the present invention, a TOP N operation is performed through the use of a subquery that includes an ORDER BY clause and a restriction that references the result set of the subquery. The following query EX is provided as an example: SELECT salary FROM (SELECT salary FROM payroll ORDER BY salary) WHERE rownum<10" (Column 2, lines 51-58).

Regarding claim 4, **Amor** further teaches a data store query system comprising: A) wherein the query interface creates a revised sorted result buffer in response to a modification of the limit and order query, the modification being made during a pause in execution of the limit and order query (Column 4, lines 32-44).

The examiner notes that **Amor** teaches **"wherein the query interface creates a revised sorted result buffer in response to a modification of the limit and order**

query, the modification being made during a pause in execution of the limit and order query" as "Adding a new member to and removing a new member from the current TOP N subset may change the threshold used to determine whether a particular scanned row qualifies for the TOP N subset. For example, in the current illustration, the member of the TOP N subset that was removed had a sort value of 50000, the value upon which the current threshold was based. After removing that row from the TOP N set and adding the current row, the lowest sort value of any member of the current TOP N subset is 60000. At step 148, the entry threshold is recalculated to the lowest sort value of the rows that belong to the current TOP N subset. In the current illustration, the entry threshold is adjusted to 60000" (Column 4, lines 32-44).

Regarding claim 5, **Amor** further teaches a data store query system comprising:
A) wherein the sorted result buffer is stored in random access memory (Column 3, lines 48-55).

The examiner notes that **Amor** teaches **"wherein the collection of records further comprises a table having an attribute"** as "One of the TOP N subsets is stored in one or more buffers ("memory buffers") in volatile memory. This TOP N subset is referred to as the current TOP N subset. Initially, the initial TOP N subset is the current TOP N subset" (Column 3, lines 51-55).

Regarding claim 6, **Amor** further teaches a data store query system comprising:

A) wherein the query interface is operable to receive the limit and order query formulated using standard query language (SQL) (Column 1, lines 13-15, lines 34-35).

The examiner notes that **Amor** teaches **"wherein the query interface is operable to receive the limit and order query formulated using standard query language (SQL)"** as "Users of database systems retrieve data through the use of queries. A query is a request for data. Typically, queries must conform to the rules of a particular query language, such as the ANSI Structured Query Language (SQL)" (Column 1, lines 13-15) and "When a database system executes an SQL query, the database system returns results in the form of a set of rows" (Column 1, lines 34-35).

Regarding claim 7, **Amor** further teaches a data store query system comprising:
A) wherein the query interface is operable to receive the limit and order query that requests the first or last N records satisfying the query (Column 1, lines 49-52).

The examiner notes that **Amor** teaches **"wherein the query interface is operable to receive the limit and order query that requests the first or last N records satisfying the query"** as "Rows may be returned in ascending or descending order. The default is ascending. The return order may be specified using the keyword ASC for ascending or DESC for descending" (Column 1, lines 49-52).

Regarding claim 8, **Amor** further teaches a data store query system comprising:
A) wherein the query interface is operable to identify data in the data store that satisfies the limit and order query using the sorted result buffer by iteratively reformulating the

limit and order query until the sorted result buffer contains the satisfying limit and order query (Column 4, lines 32-44).

The examiner notes that **Amor** teaches **"wherein the query interface is operable to identify data in the data store that satisfies the limit and order query using the sorted result buffer by iteratively reformulating the limit and order query until the sorted result buffer contains the satisfying limit and order query"** as "Adding a new member to and removing a new member from the current TOP N subset may change the threshold used to determine whether a particular scanned row qualifies for the TOP N subset. For example, in the current illustration, the member of the TOP N subset that was removed had a sort value of 50000, the value upon which the current threshold was based. After removing that row from the TOP N set and adding the current row, the lowest sort value of any member of the current TOP N subset is 60000. At step 148, the entry threshold is recalculated to the lowest sort value of the rows that belong to the current TOP N subset. In the current illustration, the entry threshold is adjusted to 60000" (Column 4, lines 32-44).

Regarding claim 9, **Amor** teaches a method comprising:

A) receiving a limit and order query that includes both of an order criteria and a limit criteria (Column 2, lines 51-58);

B) the limit criteria specifying a maximum number N of records for a result set of records satisfying the limit and order query (Column 1, lines 54-59);

C) filling a constant-sized sorted result buffer with a first N number of records from a data store (Column 3, lines 40-44);

D) iteratively ordering the sorted result buffer based upon the order criteria (Column 3, lines 56-64);

E) iteratively comparing remaining records in the data store against a Nth record in the sorted result buffer based upon the order criteria (Column 4, lines 12-16, lines 32-44);

F) iteratively replacing the Nth record in the sorted result buffer with a remaining record in the data store based upon iteratively comparing remaining records in the data store against the Nth record in the sorted result buffer (Column 4, lines 32-44); and

G) outputting the sorted result buffer as the result set of records (Column 5, lines 13-15).

The examiner notes that **Amor** teaches **"receiving a limit and order query that includes both of an order criteria and a limit criteria"** as "According to an embodiment of the present invention, a TOP N operation is performed through the use of a subquery that includes an ORDER BY clause and a restriction that references the result set of the subquery. The following query EX is provided as an example: SELECT salary FROM (SELECT salary FROM payroll ORDER BY salary) WHERE rownum<10" (Column 2, lines 51-58). The examiner further notes that **Amor** teaches **"the limit criteria specifying a maximum number N of records for a result set of records satisfying the limit and order query"** as "A user that requests ordered data may desire only the TOP N rows in order. The term "TOP N" refers to the first N data items in an ordered set of data items. For example, the first 10 rows from payroll in ascending

order based on salary. An operation or process that returns the TOP N data items based on an order is referred to as a TOP N operation" (Column 1, lines 54-59). The examiner further notes that **Amor** teaches **"filling a constant-sized sorted result buffer with a first N number of records from a data store"** as "the initial TOP N set is formed. The initial TOP N set includes the first N rows scanned. The initial N rows scanned are in the TOP N subset because, at least initially, they may all be TOP N rows. In this example, the first 10 rows scanned are from the payroll table, and thus the initial TOP N subset is formed" (Column 3, lines 40-44). The examiner further notes that **Amor** teaches **"iteratively ordering the sorted result buffer based upon the order criteria"** as "At step 114, the entry threshold is established. The entry threshold is used to determine whether a scanned row belongs to the current TOP N subset. The entry threshold is compared to the sort value of each row as the row is scanned. How the threshold is established and used is based on whether the result set to be returned for the subquery should be in ascending or descending order. If the subquery returns the result set in descending order, then the threshold is the smallest sort value in the current TOP N subset. If the sort value of the scanned row is greater than the threshold, then the scanned row is added to the current TOP N subset" (Column 3, lines 56-64). The examiner further notes that **Amor** teaches **"iteratively comparing remaining records in the data store against a Nth record in the sorted result buffer based upon the order criteria"** as "At step 126, the sort value of the scanned row is compared with the threshold to determine whether the row belongs in the current TOP N subset. In this example, the scanned row has a sort value of 75000, which is greater

than the threshold. Therefore, the row belongs to the TOP N subset" (Column 4, lines 12-16). The examiner further notes that **Amor** teaches **"iteratively replacing the Nth record in the sorted result buffer with a remaining record in the data store based upon iteratively comparing remaining records in the data store against the Nth record in the sorted result buffer"** as "For example, in the current illustration, the member of the TOP N subset that was removed had a sort value of 50000, the value upon which the current threshold was based. After removing that row from the TOP N set and adding the current row, the lowest sort value of any member of the current TOP N subset is 60000. At step 148, the entry threshold is recalculated to the lowest sort value of the rows that belong to the current TOP N subset. In the current illustration, the entry threshold is adjusted to 60000" (Column 4, lines 32-44). The examiner further notes that **Amor** teaches **"outputting the sorted result buffer as the result set of records"** as "The execution of the steps ends, and the result set is returned in TOP N order" (Column 5, lines 13-15).

Regarding claim 10, **Amor** further teaches a method comprising:

A) wherein the limit and order query is formulated using standard query language (SQL) (Column 1, lines 13-15, lines 34-35).

The examiner notes that **Amor** teaches **"wherein the limit and order query is formulated using standard query language (SQL)"** as "Users of database systems retrieve data through the use of queries. A query is a request for data. Typically, queries must conform to the rules of a particular query language, such as the ANSI Structured

Query Language (SQL)" (Column 1, lines 13-15) and "When a database system executes an SQL query, the database system returns results in the form of a set of rows" (Column 1, lines 34-35).

Regarding claim 11, **Amor** further teaches a method comprising:

A) wherein filling the sorted result buffer with the first N number of records comprises scanning the data store without consideration of the order criteria to identify records otherwise satisfying the limit and order query (Column 3, lines 40-44); and

B) placing identified records into the sorted result buffer until the sorted result buffer includes the maximum number of records specified by the limit criteria (Column 3, lines 40-44).

The examiner notes that **Amor** teaches **"wherein filling the sorted result buffer with the first N number of records comprises scanning the data store without consideration of the order criteria to identify records otherwise satisfying the limit and order query"** as "the initial TOP N set is formed. The initial TOP N set includes the first N rows scanned. The initial N rows scanned are in the TOP N subset because, at least initially, they may all be TOP N rows. In this example, the first 10 rows scanned are from the payroll table, and thus the initial TOP N subset is formed" (Column 3, lines 40-44). The examiner further notes that **Amor** teaches **"placing identified records into the sorted result buffer until the sorted result buffer includes the maximum number of records specified by the limit criteria"** as "the initial TOP N set is formed. The initial TOP N set includes the first N rows scanned. The

initial N rows scanned are in the TOP N subset because, at least initially, they may all be TOP N rows. In this example, the first 10 rows scanned are from the payroll table, and thus the initial TOP N subset is formed" (Column 3, lines 40-44).

Regarding claim 12, **Amor** further teaches a data store query system comprising: A) wherein the limit and order query requests the first N records satisfying the order criteria (Column 1, lines 49-52).

The examiner notes that **Amor** teaches **"wherein the limit and order query requests the first N records satisfying the order criteria"** as "Rows may be returned in ascending or descending order. The default is ascending. The return order may be specified using the keyword ASC for ascending or DESC for descending" (Column 1, lines 49-52).

Regarding claim 13, **Amor** further teaches a data store query system comprising: A) wherein the limit and order query requests the last N records satisfying the order criteria (Column 1, lines 49-52).

The examiner notes that **Amor** teaches **"wherein the limit and order query requests the last N records satisfying the order criteria"** as "Rows may be returned in ascending or descending order. The default is ascending. The return order may be specified using the keyword ASC for ascending or DESC for descending" (Column 1, lines 49-52).

Regarding claim 14, **Amor** teaches an apparatus comprising:

A) a first code segment for receiving a limit and order query that includes both of an order criteria and a limit criteria (Column 2, lines 51-58);

B) the limit criteria specifying a maximum number N of records for a result set of records satisfying the limit and order query (Column 1, lines 54-59);

C) a second code segment for filling a constant-sized sorted result buffer with a first N number of records from a data store (Column 3, lines 40-44);

D) a third code segment for iteratively ordering the sorted result buffer based upon the order criteria (Column 3, lines 56-64);

E) a fourth code segment for iteratively comparing remaining records in the data store against a Nth record in the sorted result buffer based upon the order criteria (Column 4, lines 12-16, lines 32-44);

F) a fifth code segment for iteratively replacing the Nth record in the sorted result buffer with a remaining record in the data store based upon iteratively comparing remaining records in the data store against the Nth record in the sorted result buffer (Column 4, lines 32-44); and

G) a sixth code segment for outputting the sorted result buffer as the result set of records (Column 5, lines 13-15).

The examiner notes that **Amor** teaches **"a first code segment for receiving a limit and order query that includes both of an order criteria and a limit criteria"** as "According to an embodiment of the present invention, a TOP N operation is performed through the use of a subquery that includes an ORDER BY clause and a restriction that

references the result set of the subquery. The following query EX is provided as an example: SELECT salary FROM (SELECT salary FROM payroll ORDER BY salary) WHERE rownum<10" (Column 2, lines 51-58). The examiner further notes that **Amor** teaches **"the limit criteria specifying a maximum number N of records for a result set of records satisfying the limit and order query"** as "A user that requests ordered data may desire only the TOP N rows in order. The term "TOP N" refers to the first N data items in an ordered set of data items. For example, the first 10 rows from payroll in ascending order based on salary. An operation or process that returns the TOP N data items based on an order is referred to as a TOP N operation" (Column 1, lines 54-59). The examiner further notes that **Amor** teaches **"a second code segment for filling a constant-sized sorted result buffer with a first N number of records from a data store"** as "the initial TOP N set is formed. The initial TOP N set includes the first N rows scanned. The initial N rows scanned are in the TOP N subset because, at least initially, they may all be TOP N rows. In this example, the first 10 rows scanned are from the payroll table, and thus the initial TOP N subset is formed" (Column 3, lines 40-44). The examiner further notes that **Amor** teaches **"a third code segment for iteratively ordering the sorted result buffer based upon the order criteria"** as "At step 114, the entry threshold is established. The entry threshold is used to determine whether a scanned row belongs to the current TOP N subset. The entry threshold is compared to the sort value of each row as the row is scanned. How the threshold is established and used is based on whether the result set to be returned for the subquery should be in ascending or descending order. If the subquery returns the result set in descending

order, then the threshold is the smallest sort value in the current TOP N subset. If the sort value of the scanned row is greater than the threshold, then the scanned row is added to the current TOP N subset" (Column 3, lines 56-64). The examiner further notes that **Amor** teaches **"a fourth code segment for iteratively comparing remaining records in the data store against a Nth record in the sorted result buffer based upon the order criteria"** as "At step 126, the sort value of the scanned row is compared with the threshold to determine whether the row belongs in the current TOP N subset. In this example, the scanned row has a sort value of 75000, which is greater than the threshold. Therefore, the row belongs to the TOP N subset" (Column 4, lines 12-16). The examiner further notes that **Amor** teaches **"a fifth code segment for iteratively replacing the Nth record in the sorted result buffer with a remaining record in the data store based upon iteratively comparing remaining records in the data store against the Nth record in the sorted result buffer"** as "For example, in the current illustration, the member of the TOP N subset that was removed had a sort value of 50000, the value upon which the current threshold was based. After removing that row from the TOP N set and adding the current row, the lowest sort value of any member of the current TOP N subset is 60000. At step 148, the entry threshold is recalculated to the lowest sort value of the rows that belong to the current TOP N subset. In the current illustration, the entry threshold is adjusted to 60000" (Column 4, lines 32-44). The examiner further notes that **Amor** teaches **"a sixth code segment for outputting the sorted result buffer as the result set of records"** as "The

execution of the steps ends, and the result set is returned in TOP N order" (Column 5, lines 13-15).

Regarding claim 21, **Amor** further teaches a data store query system comprising: A) wherein the size of the constant-sized sorted result buffer is based on the limit criteria (Column 3, lines 40-44).

The examiner notes that **Amor** teaches **"wherein the size of the constant-sized sorted result buffer is based on the limit criteria"** as "the initial TOP N set is formed. The initial TOP N set includes the first N rows scanned. The initial N rows scanned are in the TOP N subset because, at least initially, they may all be TOP N rows. In this example, the first 10 rows scanned are from the payroll table, and thus the initial TOP N subset is formed" (Column 3, lines 40-44).

Response to Arguments

7. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Book entitled "SQL Server DTS", by **Hughes et al.**, dated 2002. The subject matter disclosed therein is pertinent to that of claims 1-14, and 21 (e.g., methods to iteratively attain query results via desired top n requests from users).

Article entitled "The "top ten" problem", by **Mullins**, dated May 2002. The subject matter disclosed therein is pertinent to that of claims 1-14, and 21 (e.g., methods to iteratively attain query results via desired top n requests from users).

U.S. Patent 6,651,055 issued to **Kilmer et al.** on 18 November 2003. The subject matter disclosed therein is pertinent to that of claims 1-14, and 21 (e.g., methods to iteratively attain query results via desired top n requests from users).

U.S. Patent 5,671,403 issued to **Shekita et al.** on 23 September 1997. The subject matter disclosed therein is pertinent to that of claims 1-14, and 21 (e.g., methods to iteratively attain query results via desired top n requests from users).

Article entitled "Single Buffered Histogram Sort" by **McCoskey**, (04 February 1999). The subject matter disclosed therein is pertinent to that of claims 1-14, and 21 (e.g., methods to iteratively attain query results via desired top n requests from users).

U.S. Patent 5,974,408 issued to **Cohen et al.** on 26 October 1999. The subject matter disclosed therein is pertinent to that of claims 1-14, and 21 (e.g., methods to iteratively attain query results via desired top n requests from users).

U.S. PGPUB 2003/0233340 issued to **Flasza et al.** on 18 December 2003. The subject matter disclosed therein is pertinent to that of claims 1-14, and 21 (e.g., methods to iteratively attain query results via desired top n requests from users).

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mahesh Dwivedi whose telephone number is (571) 272-2731. The examiner can normally be reached on Monday to Friday 8:20 am – 4:40 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Vo can be reached (571) 272-3642. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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February 21, 2007

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